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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,358	05/13/2002	Horst Berneth	Mo-7059/LcA 33,071	1359
157	7590	03/16/2006	EXAMINER	
BAYER MATERIAL SCIENCE LLC 100 BAYER ROAD PITTSBURGH, PA 15205			ANGEBRANNDT, MARTIN J	
			ART UNIT	PAPER NUMBER
			1756	

DATE MAILED: 03/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/089,358

Applicant(s)

BERNETH ET AL.

Examiner

Martin J. Angebrannt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/12/03 & 10/24/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 19-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-29 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>03/12/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

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1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

- I. Claims 1-18 and 29, drawn to optical recording media and use thereof.
- II. Claims 19-23 and 27-28, drawn to various azo based monomers and polymerization thereof.
- III. Claim 24, drawn to azo based polymer compositions.

2. The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The claims fail to make a contribution beyond that of the prior art as evidenced by the references marked "X" or "Y" in the PCT search report of December 14, 2000. In particular any feature which unites them fails to confer patentability.

3. During a telephone conversation with Aaron Pries on March 7, 2006 a provisional election was made with traverse to prosecute the invention of group I, claims 1-18 and 29.

Affirmation of this election must be made by applicant in replying to this Office action. Claims 19-28 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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“The further layer” and “the dye containing layer” lack antecedent basis (claim 16).

Claim 5 should depend upon claim 3 as the covering layer is introduced there.

The applicant should carefully review the claims for antecedent basis issues as the dependency was changed from “any one of the above claims” to claim 1.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1,2,4,8-13,15-17 and 29 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Kim et al. “Laser induced holographic surface relief gratings on non-linear optical polymer films”, Appl. Phys Lett., Vol. 66(10) pp. 1166-1168 (03/1995).

Kim et al. “Laser induced holographic surface relief gratings on non-linear optical polymer films”, Appl. Phys Lett., Vol. 66(01) pp. 1166-1168 (03/1995) describes an epoxy based polymer with a pendant 4-(4'-nitrophenylazo) phenyl moiety which is coated to a thickness of

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0.6 microns on glass slides of silicon wafers. This was subjected to recording using the 488 nm line of an Argon ion laser with an energy of 70 mW/cm^2 with both of the instant beams being in the p-polarization. The gratings formed are surface relief gratings and are due to the cis-trans isomerization of the azo moiety. (page 1166). The depth of the surface relief patterns is 120 nm. (page 1166) the formation of a single dimensional grating is shown in figure 1 and extends at least 7 microns in each direction. This is then overcoated with a 50 nm gold layer (page 1167)

This is described in the instant specification as teachings surface grating formation in photoaddressable polymers.

9. Claims 1,2,4,6-13,15,17 and 29 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Hvilsted et al., "Side chain liquid crystalline polyesters for optical storage", Optics Lett., Vol. 17(17) pp. 1234-1236 (09/1992).

Hvilsted et al., "Side chain liquid crystalline polyesters for optical storage", Opt. Lett., Vol. 17(17) pp. 1234-1236 (09/1992) teaches a side chain LC polyester shown in figure 1 together with its absorption spectrum coated to a thickness of 5 microns (page 1234). The use of 475, 488 or 515 nm Ar ion laser exposure is disclosed. In figure 2, the period of the grating is shown to be 1.5 microns and the lines of the grating extend well past that. The laser intensity is about 5 mW/cm^2 . (page 1235) The use of 400 nm as the recording wavelength is described as desirable due to the high absorption. (page 1236).

10. Claims 1-7,9,10,12,14-16 and 29 are rejected under 35 U.S.C. 102(e) as being fully anticipated by Yamamoto et al. '615.

Yamamoto et al. '615 describe with respect to figure 2 a polymer substrate, such as polycarbonate, the recording layer formed of azobenzene based on the compounds shown in

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column 4, which is then coated with a reflective layer and a UV curable layer (5/51-6/18). The laser used in recording is 400-780 (8/20-26). The detection and exposure each use polarization. (10/16-46).

11. Claims 1,2,4,6-13,15,17 and 29 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Hvilsted et al., "Novel Side chain liquid crystalline polyesters architecture for reversible optical storage", Macromol., Vol. 28(7) pp. 2172-2183 (1995).

Hvilsted et al., "Novel Side chain liquid crystalline polyesters architecture for reversible optical storage", Macromol., Vol. 28(7) pp. 2172-2183 (1995) teaches side chain LC polyesters shown in table 1 together with its absorption spectrum coated to a thickness of 4-6 microns (section 3.1.4 and 3.2.2 use the same thickness). The use of an Ar ion laser exposure and detection using an IR laser and polarization for each is disclosed (3.2.2). A similar process is disclosed in section 3.3, which uses laser powers of 65-390 mW/cm² (page 2180). In section 3.3.2 teaches a 1 microns film and shows the absorption in figure 1. In figure 19, the period of the grating is shown to be 1.3 microns (and the lines of the grating extend well past that). The laser intensity is about 1-1000 mW/cm². (page 2182). The use of 455-515 nm as the recording wavelength is described as desirable due to the high absorption. (page 2182).

12. Claims 1-15,17 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hvilsted et al., "Novel Side chain liquid crystalline polyesters architecture for reversible optical storage", Macromol., Vol. 28(7) pp. 2172-2183 (1995), in view of Ninomiya et al. '092 or Akashi et al. EP 669548.

Ninomiya et al. '092 teach LC recording layers provided on polymeric substrates (12/35-41). The overcoating of the LC polymers layer with a surface protective layer is disclosed to

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provide resistance to damage from abrasion, heat and the like (12/60-65). Useful materials for the surface protective layer include UV curable resins and the like including various acrylates (13/1-58).

Akashi et al. EP 669548 teaches in example 1, an LC materials applied to an Al coated polyethylene substrate and overcoated with a UV curable layer. (pages 11-12.) The use of azo dyes is disclosed with respect to the formulae a-k and the fact that X and Y may be N=N as discussed in page 5. The use of azobenzene is also specifically described. On page 4 at line 26. Useful protective layers are described. (9/6-9).

It would have been obvious to one skilled in the art to modify the teachings of Hvilsted et al., "Novel Side chain liquid crystalline polyesters architecture for reversible optical storage", Macromol., Vol. 28(7) pp. 2172-2183 (1995) by adding a protective layer known to be useful with LC materials, such as those disclosed by Akashi et al. EP 669548 or Ninomiya et al. '092 with a reasonable expectation of forming a useful azo based LC recording medium which is protected from mechanical damage. Further it would have been obvious to use other substrate materials, such as the polymers disclosed by Ninomiya et al. '092 or Akashi et al. EP 669548, in place of the glass substrate exemplified by Hvilsted et al., "Novel Side chain liquid crystalline polyesters architecture for reversible optical storage", Macromol., Vol. 28(7) pp. 2172-2183 (1995) with a reasonable expectation of success based upon the disclosure of equivalent functionality.

13. Claims 1,2,4,6-12,15,17 and 29 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Natansohn et al. WO 93/03073.

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Example 7 on pages 14-16 teaches an azo based polymer film formed to a thickness of about 500 nm on a transparent glass substrate, the recording is preformed using a linearly polarized argon ion laser operating at 5 mW and a 1 mm beam diameter.

14. Claims 1,2,4,6-12,15,17 and 29 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Stumpe et al. DE 4339862.

Example 36 on page 19 use the 15 microns thick film of the polymer of example 20 applied in the manner of example 14 which uses an azo based polymer film formed on transparent glass substrate, the recording is preformed using a linearly polarized argon ion laser operating at 100 mW/cm² and a spot size diameter of 10 microns.

15. Claims 1,2,4,8-13,15-17 and 29 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Elmasry '819.

Example 9 has a glass substrate coated with aluminum and a polymeric azo dye having the structure shown is coated to a thickness of 0.15 microns. This is exposed to a laser modulated by an acousto-optic modulator.

16. Claims 1,2,4,8-13,15-17 and 29 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Savant et al. '221.

Examples XIII-XX has a glass substrate and a polymeric azo dye coated to a thickness between 20- and 35 microns. This is exposed to a laser modulated by an electro-optic modulator which varies the polarization and is readout using polarized light and detecting the polarization of the reflected light.

17. Claims 1,2,4,8-13,15-18 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savant et al. '221 and Elmasry '819.

It would have been obvious to one skilled in the art to one skilled in the art to modify the cited example of Savant et al. '221 by using other modulation means, such as the acousto-optic modulator taught by Elmasry '819, in place of the EOM with a reasonable expectation of being able to record data and read it out using the polarization as discussed by Savant et al. '221 and/or it would have been obvious to one skilled in the art to modify the cited example of Elmasry '819 buy using the polarization detection taught by Savant et al. '221 with a reasonable expectation of being able to record data and read it out using the polarization as discussed by Savant et al. '221.

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Watanabe et al. '680 and Kanno et al. 476 are optical recording media and discuss protective layers.

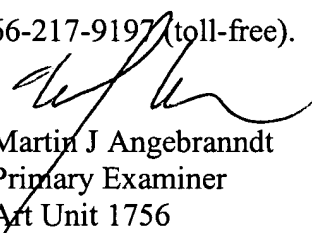
Haarer et al. '585, Bieringer et al. '846, Hvilsted et al. 670, Berneth et al. ('290,799 and 113) are all concerned with azo based recording media having compositions similar to those claims and are cumulative to the above references.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebrannndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Martin J Angebranndt
Primary Examiner
Art Unit 1756

03/08/2006